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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,473	11/16/2001	Weishi Feng	MP0112	5701

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EXAMINER	
PATHAK, SUDHANSHU C	
ART UNIT	**PAPER NUMBER**
2634	

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/991,473	FENG ET AL.	
	Examiner	Art Unit	
	Sudhanshu C. Pathak	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *November 16th, 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-228* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *See Continuation Sheet* is/are allowed.

6)☒ Claim(s) *See Continuation Sheet* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *February 5th, 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 1.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-to-228 are pending in the application.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The disclosure is objected to because of the following:

The Specification on Page 15 refers to Equations 2 & 3, however the equations are identical.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 2, 6, 10, 14, 18, 22, 27, 31, 35, 40, 44, 48, 52, 56, 60, 65, 69, 73, 78, 82, 86, 90, 94, 98, 103, 107, 111, 116, 120, 124, 128, 132, 136, 141, 145, 149, 154, 158, 162, 166, 170, 174, 179, 183, 187, 192, 196, 200, 204, 208, 212, 217, 221 & 225 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with

the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding to Claims 2, 14, 27, 40, 52, 65, 78, 90, 103, 116, 128, 141, 154, 166, 179, 192, 204 & 217, the claims refer to the signal quality values computed as described in Equation 1 on Page 9 in the specification, however it is not clear as to how this equation relates to the signal quality computed as described on Page 4, lines 3-9 & Abstract, lines 9-15 wherein the signal quality is computed by computing the peak-to-average ratio values which further includes determining the average sample value and the peak sample value wherein the average sample value is the average of all of the predetermined number of sample values and the peak sample value is the maximum of all of the predetermined number of sample values. More specifically it is not clear as to how the "denominator expression" of Equation 1 is the average sample value.

Regarding to Claims 6, 10, 18, 22, 31, 35, 44, 48, 56, 60, 69, 73, 82, 86, 94, 98, 107, 111, 120, 124, 132, 136, 145, 149, 158, 162, 170, 174, 183, 187, 196, 200, 208, 212, 221 & 225, the claims refer to the signal quality values computed as described in Equations 2/3 (equations 2 & 3 are identical) on Page 15 in the specification, however it is not clear as to how this equation relates to the signal quality computed as described on Page 4, lines 3-9 & Abstract, lines 9-15 wherein the signal quality is computed by computing the peak-to-average ratio values which

further includes determining the average sample value and the peak sample value wherein the average sample value is the average of all of the predetermined number of sample values and the peak sample value is the maximum of all of the predetermined number of sample values. More specifically it is not clear as to how the "denominator expression" of Equations 2/3 is the average sample value.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 5, 8-9, 43, 46-47, 81, 84-85, 119, 122-123, 157, 160-161, 195 & 198-199 recites the limitation "wherein a predetermined number of sample values for each spreading codeword" in claims 5, 43, 81, 119, 157, 195, lines 1-2. There is insufficient antecedent basis for this limitation in the claim. The corresponding independent claims i.e. claim 5 is dependent on claim 1 (the independent claim), discloses "the spreading code including a predetermined number of chips".

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1, 12, 39, 50, 77, 88, 115, 126, 153, 164, 191 & 202, are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Liu et al. ("Advanced low-complexity HIPERLAN receiver using combined antenna switching diversity and simple equalizer"; IEEE 47th Vehicular

Technology Conference, Volume 3; May 4-7, 1997; Page(s): 2037 – 2041) in further view of Sarinnapakorn, K. ("IEEE 802.11b High Rate Wireless Local Area Networks"; http://alpha.fdu.edu/~kanoksri/IEEE80211b.html ; March 15th, 2001; Pages 1-8).

Regarding to Claims 1, 12, 39, 50, 77, 88, 115, 126, 153, 164, 191 & 202, the Applicant Admitted Prior Art (AAPA) discloses a communication system for communicating data packets including the receiver subsystem (Fig. 1) that uses antenna diversity comprising at least two separate antennas (Specification, Page 1, Paragraph 2, lines 1-6). The AAPA also discloses the receiver designed to select an antenna, from the plurality of antennas, based on the measured signal quality (Specification, Page 1, Paragraph 2, lines 6-9 & Specification, Page 2, Paragraph 5, lines 1-4 & Specification, Page 2, Paragraph 6, lines 1-4). The AAPA also discloses the signal quality parameter to include a signal-to-noise ratio (Specification, Page 2, Paragraph 5, lines 1-5). However, the AAPA does not specify the receiver to be a direct sequence spread spectrum comprising a demodulator configured to correlate a spreading code with a preamble of each data packet.

Liu discloses a wireless local area network (WLAN) comprising an antenna switching diversity so as to mitigate the inter symbol interference (ISI) effects (Abstract & Page 2037, right-column, lines 18-30 & Fig. 2). Liu also discloses the WLAN standard HIPERLAN (European standard) to comprise a preamble for synchronization (Page 2037, left-column, Introduction, lines 10-14 & Fig. 1). Liu also discloses a preamble processing unit (demodulator) used to measure the signal

quality for each antenna so as to select the best antenna (Page 2038, left-column, lines 22-35). Liu also discloses correlating the received samples from each antenna with the corresponding stored sync bits (Page 2040, left-column & Fig.'s 6-7). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Liu teaches a WLAN standard for communication of data packets comprising preamble bits which are correlated and then used to determine the signal quality of the received signals of the antennas and this can be implemented with the communication system and receiver as described in the AAPA so as to demodulated the received signals for each antenna before determining the signal quality of each received signal. However, the AAPA in view of Liu does not disclose the system to implement a direct sequence spread spectrum (transmission) modulation scheme.

Sarinnapakorn discloses an WLAN standard (802.11b) comprising a physical layer that covers the physical (RF) interface between devices concerned with the transmitting and receiving of the data further comprising direct sequence spread spectrum (DSSS) technology (Page 2, "IEEE 802.11b Physical Layer"). Sarinnapakorn also discloses the spreading code comprising an eleven chip Barker code (Page 2, "IEEE 802.11b Physical Layer", Table (bottom of page)). Sarinnapakorn also discloses the frame format for the 802.11b standard to include a preamble for synchronization (Page 3, "The PLCP Frame Format"). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Sarinnapakorn teaches DSSS technology in a WLAN communication system and this can be implemented in the communication system as describe in the AAPA

in view of Liu so as to provide increased data rate and increased reliability of communication in a noisy environment. Furthermore, even though Sarinnapakorn implements a 802.11b standard and Liu a HIPERLAN/2 standard the physical layer for both standards is common (the same), thus satisfying the limitations of the claim.

10. Claims 3, 4, 41, 42, 79, 80, 117, 118, 155, 156, 193 & 194, are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Liu et al. ("Advanced low-complexity HIPERLAN receiver using combined antenna switching diversity and simple equalizer"; IEEE 47th Vehicular Technology Conference, Volume 3; May 4-7, 1997; Page(s): 2037 – 2041) in further view of Sarinnapakorn, K. ("IEEE 802.11b High Rate Wireless Local Area Networks"; http://alpha.fdu.edu/~kanoksri/IEEE80211b.html ; March 15th, 2001; Pages 1-8) in further view of Ramasami ("Orthogonal Frequency Division Multiplexing"; http://www.ittc.ku.edu/~rvc/documents/862/862_ofdmreport.pdf ; Pages 1-27).

Regarding to Claims 3, 4, 41, 42, 79, 80, 117, 118, 155, 156, 193 & 194, the AAPA in view of Liu in further view of Sarinnapakorn discloses a communication system comprising a receiver subsystem further comprising multiple antennas for implementing antenna diversity wherein the receiver computes the signal quality so as to determine the best antenna for receiving the direct sequence spread spectrum signal as described above. Liu further discloses the receiver comprising an analog-to-digital (ADC) converter in communication with each of the antennas and the demodulator and being configured to extract a predetermined number of sample

values for each spreading code (Fig. 2 & Page 2038, left-column, lines 22-35 & Page 2040, left-column, Preamble Processing). However, the AAPA in view of Liu in further view of Sarinnapakorn does not disclose the signal quality measurement device to compute the peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

Ramasami discloses wireless LAN as one of the most important applications implementing OFDM including the 802.11 standard (Page 25, Sec. 6.3, Wireless LAN & Page 26 (complete page)). Ramasami also discloses peak-to-average ratio (PAR) to be a critical parameter of signal quality in an OFDM system, which may cause degradation in the BER performance and out-of-band radiation (Page 16, Section 3, "Peak Power Problem in OFDM" & Page 17). Ramasami also discloses implementing various codes as a solution (among others) to the PAR problem in an OFDM system (Page 17, Sec. 3.2, Clipping & Page 18 (complete page) & Page 19, Sec. 3.6). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention the Ramasami teaches the importance of PAR as a signal quality parameter in an OFDM system and this parameter can be measured in the receiver as describe in the AAPA in view of Liu in further view of Sarinnapakorn so as to select the antenna in the receiver based on PAR value so as to increase the reliability of the received data, thus satisfying the limitations of the claims.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention that PAR is computed by dividing the peak sample value by the average sample value.

11. Claims 5, 8-9, 43, 46-47, 81, 84-85, 119, 122-123, 157, 160-161, 195 & 198-199, are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Liu et al. ("Advanced low-complexity HIPERLAN receiver using combined antenna switching diversity and simple equalizer"; IEEE 47th Vehicular Technology Conference, Volume 3; May 4-7, 1997; Page(s): 2037 – 2041) in further view of Sarinnapakorn, K. ("IEEE 802.11b High Rate Wireless Local Area Networks"; http://alpha.fdu.edu/~kanoksri/IEEE80211b.html ; March 15th, 2001; Pages 1-8) in further view of Grau et al. (5,077,753).

Regarding to Claims 5, 8-9, 43, 46-47, 81, 84-85, 119, 122-123, 157, 160-161, 195 & 198-199, the AAPA in view of Liu in further view of Sarinnapakorn discloses a communication system comprising a receiver subsystem further comprising multiple antennas for implementing antenna diversity wherein the receiver computes the signal quality so as to determine the best antenna for receiving the direct sequence spread spectrum signal as described above. However, the AAPA in view of Liu in further view of Sarinnapakorn does not disclose the predetermined number of sample values for each spreading code is equal to a predetermined number of chips in the spreading code wherein the predetermined sample value is double the predetermined number of chips in the spreading code.

Grau discloses a spread spectrum communications system and method comprising oversampling the input signal for digitally correlating the signal with a stored signal wherein the chipping sequence is an eleven-bit Barker code (Abstract, lines 7-16 & Fig. 1A & Fig.'s 3-4). Grau also discloses oversampling the signal by six times the predetermined number of chips for despreading the received samples (Column 4, lines 13-30). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Grau teaches oversampling the received signal for the despreading of the signal and this can be implemented in the communication system and receiver as described in the AAPA in view of Liu in further view of Sarinnapakorn so as to increase the accuracy of the received signal so as to provide immunity to clock inaccuracies and jitter thus satisfying the limitation of the claims.

12. Claims 7, 11, 45, 49, 83, 87, 121, 125, 159, 163, 197 & 201, are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Liu et al. ("Advanced low-complexity HIPERLAN receiver using combined antenna switching diversity and simple equalizer"; IEEE 47th Vehicular Technology Conference, Volume 3; May 4-7, 1997; Page(s): 2037 – 2041) in further view of Sarinnapakorn, K. ("IEEE 802.11b High Rate Wireless Local Area Networks"; http://alpha.fdu.edu/~kanoksri/IEEE80211b.html ; March 15th, 2001; Pages 1-8) in further view of Grau et al. (5,077,753) in further view of Ramasami ("Orthogonal Frequency Division Multiplexing"; http://www.ittc.ku.edu/~rvc/documents/862/862_ofdmreport.pdf ; Pages 1-27).

Regarding to Claims 7, 11, 45, 49, 83, 87, 121, 125, 159, 163, 197 & 201, the AAPA in view of Liu in further view of Sarinnapakorn discloses a communication system comprising a receiver subsystem further comprising multiple antennas for implementing antenna diversity wherein the receiver computes the signal quality so as to determine the best antenna for receiving the direct sequence spread spectrum signal as described above. However, the AAPA in view of Liu in further view of Sarinnapakorn does not disclose the predetermined number of sample values for each spreading code is equal to a predetermined number of chips in the spreading code wherein the predetermined sample value is double the predetermined number of chips in the spreading code.

Grau discloses a spread spectrum communications system and method comprising oversampling the input signal for digitally correlating the signal with a stored signal wherein the chipping sequence is an eleven-bit Barker code (Abstract, lines 7-16 & Fig. 1A & Fig.'s 3-4). Grau also discloses oversampling the signal by six times the predetermined number of chips for despreading the received samples (Column 4, lines 13-30). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Grau teaches oversampling the received signal for the despreading of the signal and this can be implemented in the communication system and receiver as described in the AAPA in view of Liu in further view of Sarinnapakorn so as to increase the accuracy of the received signal so as to provide immunity to clock inaccuracies and jitter thus satisfying the limitation of the claims. However, the AAPA in view of Liu in further view of Sarinnapakorn

does not disclose the signal quality measurement device to compute the peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

Ramasami discloses wireless LAN as one of the most important applications implementing OFDM including the 802.11 standard (Page 25, Sec. 6.3, Wireless LAN & Page 26 (complete page)). Ramasami also discloses peak-to-average ratio (PAR) to be a critical parameter of signal quality in an OFDM system, which may cause degradation in the BER performance and out-of-band radiation (Page 16, Section 3, "Peak Power Problem in OFDM" & Page 17). Ramasami also discloses implementing various codes as a solution (among others) to the PAR problem in an OFDM system (Page 17, Sec. 3.2, Clipping & Page 18 (complete page) & Page 19, Sec. 3.6). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention the Ramasami teaches the importance of PAR as a signal quality parameter in an OFDM system and this parameter can be measured in the receiver as describe in the AAPA in view of Liu in further view of Sarinnapakorn in further view of Grau so as to select the antenna in the receiver based on PAR value so as to increase the reliability of the received data, thus satisfying the limitations of the claims. Furthermore, it would have been obvious to one of ordinary skill in the

art at the time of the invention that PAR is computed by dividing the peak sample value by the average sample value.

Allowable Subject Matter

13. Claims 13, 15-17, 19-21, 23-26, 28-30, 32-34, 36-38, 51, 53-55, 57-59, 61-64, 66-68, 70-72, 74-76, 89, 91-93, 95-97, 99-102, 104-106, 108-110, 112-114, 127, 129-131, 133-135, 137-140, 142-144, 146-148, 150-152, 165, 167-169, 171-173, 175-178, 180-182, 184-186, 188-190, 203, 205-207, 209-211 & 213-215 are allowed over the prior art of record.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, it is recommended to the applicant to amend all the claims so as to be patentable over the cited prior art of record. A detailed list of pertinent references is included with this Office Action (See Attached "Notice of References Cited" (PTO-892)).

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.

- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056
- The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

Continuation of Disposition of Claims: Claims rejected are 1-12,14,18,22,27,31,35,39-50,52,56,60,65,69,73,77-88,90,94,98,103,107,111,115-126,128,132,136,141,145,149,153-164,166,170,174,179,183,187,191-202,204,208,212,217,221 and 225.

Continuation of Disposition of Claims. allowed are 13, 15-17, 19-21, 23-26, 28-30, 32-34, 36-38, 51, 53-55, 57-59, 61-64, 66-68, 70-72, 74-76, 89, 91-93, 95-97, 99-102, 104-106, 108-110, 112-114, 127, 129-131, 133-135, 137-140, 142-144, 146-148, 150-152, 165, 167-169, 171-173, 175-178, 180-182, 184-186, 188-190, 203, 205-207, 209-211 & 213-215